Rapid Watershed Assessment
Lower Minnesota
(MN) HUC: 07020012

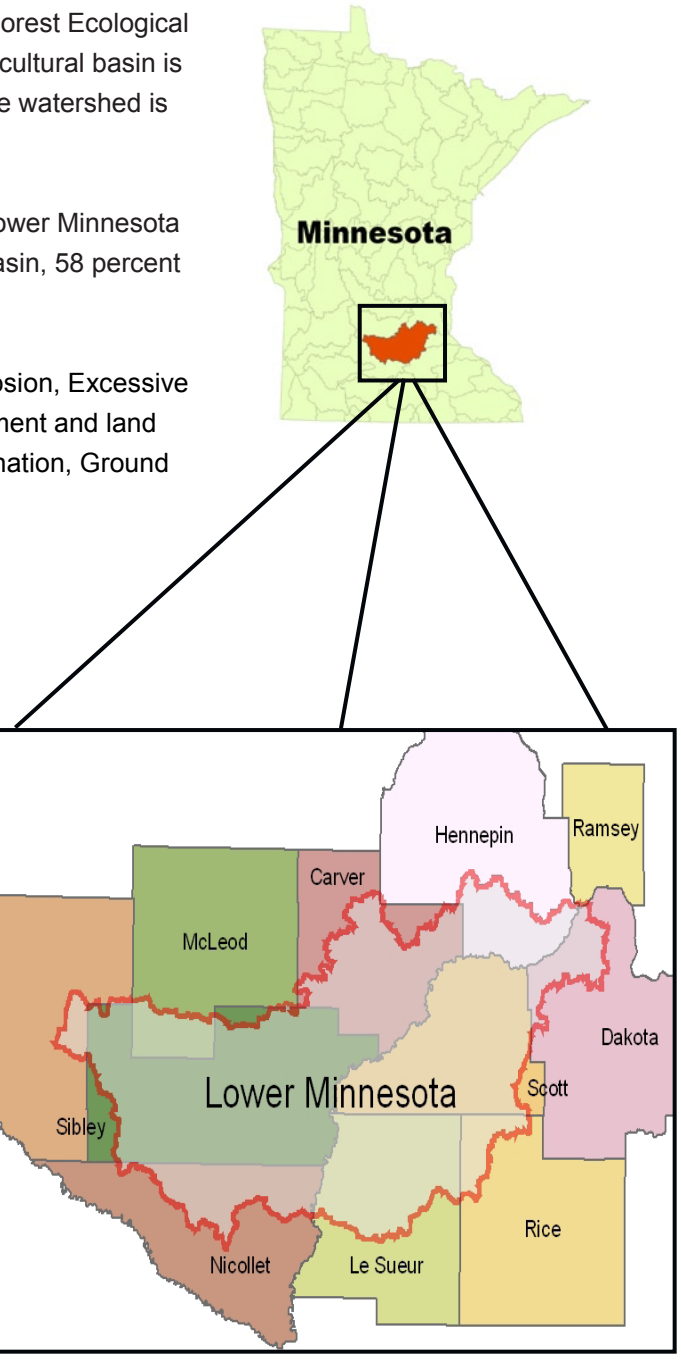
Rapid watershed assessments provide initial estimates of where conservation investments would best address the concerns of landowners, conservation districts, and other community organizations and stakeholders. These assessments help land–owners and local leaders set priorities and determine the best actions to achieve their goals.

Introduction

The Lower Minnesota 8-Digit Hydrologic Unit Code (HUC) subbasin is located in the Prairie Parkland and Eastern Broadleaf Forest Ecological Provinces of Southwestern Minnesota. This largely agricultural basin is 1,164,043 acres in size. Nearly ninety six percent of the watershed is comprised of privately owned lands.

There are an estimated 2,650 farms occurring in the Lower Minnesota Watershed. Of the nearly 2,700 operators in the subbasin, 58 percent are full time producers not reliant on off-farm income.

Resource concerns include Excessive sheet and rill erosion, Excessive wind erosion, Water quality impacts from new development and land disturbing activities and nutrient and chemical contamination, Ground water quality and quantity, Management of runoff from development and redevelopment activities, and Retaining water on the landscape through wetland management.



County	*Acres in HUC*	*% HUC*
Hennepin	69,793	6.0%
Ramsey	149	0.0%
McLeod	41,653	3.6%
Carver	146,333	12.6%
Dakota	41,971	3.6%
Renville	15,529	1.3%
Scott	224,241	19.3%
Sibley	350,914	30.1%
Le Sueur	152,092	13.1%
Rice	31,205	2.7%
Nicollet	90,161	7.7%
Total acres:	**1,164,043**	**100%**

Physical Description

Soils in this once glaciated area are predominantly glacial till and outwash. Average elevation in the watershed is 822 feet above sea level, with the highest values being in the Western and Southeastern portions of the watershed, while the lowest are found across the central and northern regions near the river valley.

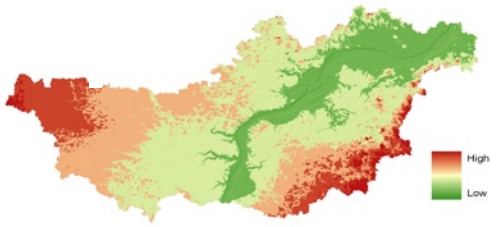
Precipitation in the watershed ranges from 27 to 31 inches annually, with the majority of the basin recieving between 27 and 29 inches of precipitation each year.

Land use within the Lower Minnesota River watershed is primarily agricultural within the western half of the watershed and is largely urban within the eastern portions. This transitional change from farming to urban communities occurs (approximately) as one travels northeast of the City of Chaska.

Nearly fifty eight percent of the total acres within the watershed are utilized for the production of row crops (mainly corn and soybeans). The remaining acres are a mixture of residential developments, business and industries, woods, wetlands, pasture, meadows, lakes, and open spaces.

Development pressure is relatively high in western areas, with farms and woodland being parceled out for residential and commercial development.

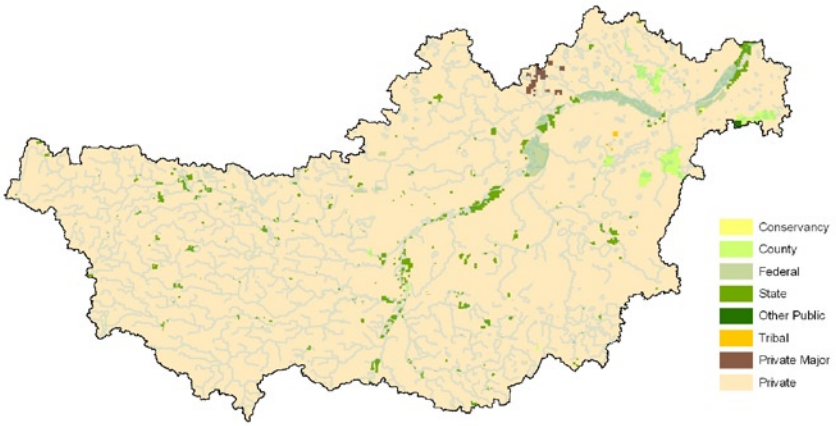
Relief



Average Precipitation (inches)

Ownership[/1]

Ownership Type	Acres	% of HUC
Conservancy	104	0.0
County	10,390	0.9
Federal	15,160	1.3
State	19,364	1.7
Other	379	0.0
Tribal	237	0.0
Private Major	2,098	0.2
Private	1,116,313	95.9
Total Acres:	**1,164,043**	**100**

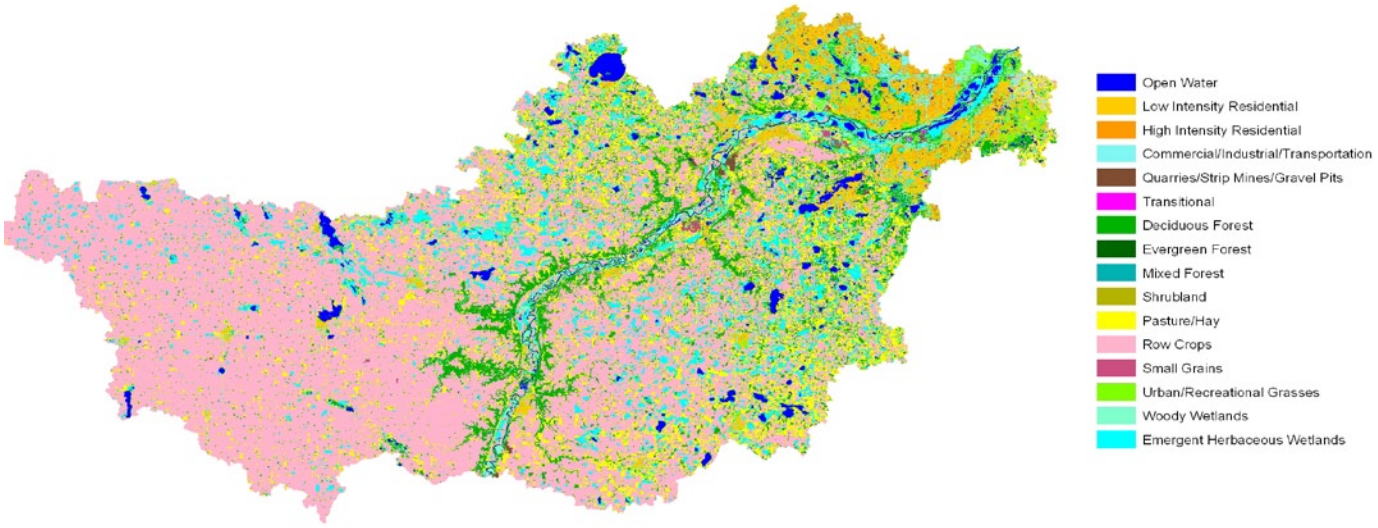


Ownership / Land Use

The Lower Minnesota Watershed covers an area of 1,164,043 acres. Over ninety-five percent of the area of the watershed is owned by private landholders (1,116,313 acres). The second largest ownership type is State with approximately 19,364 acres (1.7%), followed by Federal, with 15,150 acres (1.3%), and County lands amounting to 10,390 acres (0.9%). There are approximately 2,100 acres of Private-Major lands (0.2%), and just under 400 acres of miscellaneous public lands. Tribal land ownership in the basin amounts to 237 acres (0.02%), and data indicates slightly more than 100 acres of private conservancy lands.

Land use by ownership type is represented in the table below.

Land Use / Land Cover /2



Ownership / Land Use /3

	Public		Private**		Tribal			
Landcover/Use	**Acres**	**% Public**	**Acres**	**% Private**	**Acres**	**% Tribal**	**Total Acres**	**Percent**
Forest	12,824	1.1%	84,086	7.2%	76	0.0%	96,987	8.3%
Grass, etc	5,727	0.5%	137,053	11.8%	23	0.0%	142,803	12.3%
Orchards	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Row Crops	7,856	0.7%	664,778	57.1%	7	0.0%	672,641	57.8%
Shrub etc	2,141	0.2%	19,641	1.7%	0	0.0%	21,783	1.9%
Wetlands	7,840	0.7%	32,872	2.8%	12	0.0%	40,724	3.5%
Residential/Commercial	3,580	0.3%	151,707	13.0%	118	0.0%	155,405	13.4%
Open Water*	5,311	0.5%	28,377	2.4%	0	0.0%	33,688	2.9%
* ownership undetermined			** includes private-major					
Watershed Totals:	**45,280**	**3.89%**	**1,118,514**	**96.1%**	**237**	**0.0%**	**1,164,031.07**	**100%**

Physical Description (continued)

		ACRES	cu. ft/sec
Stream Flow Data	USGS 05330920 MINNESOTA RIVER AT FORT SNELLING STATE PARK, MN	**2007 Avg.**	5,391
		May – Sept. Yield	4,834
		MILES	**PERCENT**
Stream Data[4] **(*Percent of Total Miles of Streams in HUC)**	Total Miles – Major (100K Hydro GIS Layer)	2,655	---
	303d/TMDL Listed Streams (DEQ)	299	11%
Riparian Land Cover/Land Use[5] **(Based on a 100-foot buffer on both sides of all streams in the 100K Hydro GIS Layer)**	Forest	8,741	17.6%
	Grain Crops	0	0.0%
	Grass, etc	4,197	8.4%
	Orchards	0	0.0%
	Row Crops	19,705	39.7%
	Shrub etc	1,742	3.5%
	Wetlands	5,009	10.1%
	Residential/Commercial	3,308	6.7%
	Open Water*	6,988	14.1%
	Total Buffer Acres:	**49,690**	100%
Land Capability Class[6] *(Croplands & Pasturelands Only) (1997 NRI Estimates for Non-Federal Lands Only)*	**1** – slight limitations	93,800	12%
	2 – moderate limitations	434,300	55%
	3 – severe limitations	208,900	26%
	4 – very severe limitations	41,700	5%
	5 – no erosion hazard, but other limitations	800	0%
	6 – severe limitations; unsuitable for cultivation; limited to pasture, range, forest	8,400	1%
	7 – very severe limitations; unsuitable for cultivation; limited to grazing, forest, wildlife habitat	7,000	1%
	8 – miscellaneous areas; limited to recreation, wildlife habitat, water supply	700	0%
	Total NRI Crop & Pasture Land	**795,600**	-
Irrigated Lands[7] *(1997 NRI Estimates for Non-Federal Lands Only)*	**Type of Land**	**Acres**	% Irrigated Land / % HUC
	Cultivated Cropland	**0**	0% / 0%
	Uncultivated Cropland	**0**	0% / 0%
	Pastureland	**0**	0% / 0%
	Total Irrigated Lands	**0**	0% / 0%

Assessment of Waters

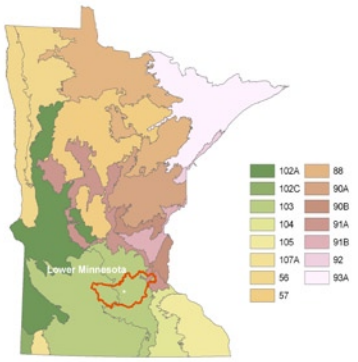
Section 303(d) of the Clean Water Act states that water bodies with impaired use(s) must be placed on a state's impaired waters list, requiring the Minnesota Pollution Control Agency (MPCA) to identify and restore impaired waters. Minnesota's impaired waters list, updated every two years, identifies assessed waters that do not meet water quality standards. The primary tool for addressing impaired waters is a pollution reduction plan called a Total Maximum Daily Load, or TMDL.

2006 TMDL Listed Streams - Lower Minnesota[7]

Listed Stream	Impairment	Affected Use
Minnesota River Rogers Cr to Cherry Cr	Hg, PCB	Aquatic Consumption
Unnamed creek Headwaters to Carver Cr	FC	Aquatic Recreation
Unnamed ditch Burandt Lk to Unnamed Cr	DO, FC	Aquatic Life and Aquatic Recreation
Unnamed creek Headwaters to Minnesota R	FC	Aquatic Recreation
Minnesota River Sand Cr to Carver Cr	Hg, PCB	Aquatic Consumption
High Island Creek JD 15 to Unnamed Cr	FC, T	Aquatic Life and Aquatic Recreation
Buffalo Creek Unnamed Cr to High Island Cr	B-F, FC	Aquatic Life and Aquatic Recreation
Unnamed creek Unnamed Cr to Unnamed Cr	B-F	Aquatic Life
Unnamed creek (East Creek) Unnamed Cr to Minnesota	B-F, FC	Aquatic Life and Aquatic Recreation
High Island Ditch 2 Unnamed Cr to High Island Cr	T	Aquatic Life
High Island Creek Unnamed Cr to Minnesota R	B-F, FC, T	Aquatic Life and Aquatic Recreation
Minnesota River Bevens Cr to Sand Cr	FC, Hg, PCB, T	Aquatic Consumption, Aquatic Life and Aquatic Recreation
Minnesota River High Island Cr to Bevens Cr	FC, Hg, PCB	Aquatic Consumption and Aquatic Recreation
Minnesota River Rush R to High Island Cr	FC, Hg, PCB, T	Aquatic Consumption, Aquatic Life and Aquatic Recreation
Minnesota River Le Sueur Cr to Rush R	Hg, PCB	Aquatic Consumption
Minnesota River RM 22 to Mississippi R	FC, Hg, PCB, T	Aquatic Consumption, Aquatic Life and Aquatic Recreation
Minnesota River Carver Cr to RM 22	Hg, PCB, T	Aquatic Consumption and Aquatic Life
Minnesota River Cherry Cr to Le Sueur Cr	FC, Hg, PCB	Aquatic Consumption and Aquatic Recreation
Bluff Creek Headwaters to Minnesota R	B-F, T	Aquatic Life
Riley Creek Riley Lk to Minnesota R	T	Aquatic Life
Chaska Creek Headwaters to Minnesota R	FC	Aquatic Recreation
Sand Creek Porter Cr to Minnesota R	B-F, T	Aquatic Life
Bevens Creek Silver Cr to Minnesota R	FC, T	Aquatic Life and Aquatic Recreation
Bevens Creek Headwaters (Washington Lk) to Silver	Cl, FC, T	Aquatic Life and Aquatic Recreation
Carver Creek Headwaters to Minnesota R	FC, T	Aquatic Life and Aquatic Recreation
Credit River Headwaters to Minnesota R	T	Aquatic Life
Ninemile Creek Headwaters to Minnesota R	B-F, Cl, T	Aquatic Life
Rush River S Br Rush R to Minnesota R	FC	Aquatic Recreation
Silver Creek CD 32 to Bevens Cr	FC, T	Aquatic Life and Aquatic Recreation
Buffalo Creek/County Ditch 59 High Island Ditch 5	FC	Aquatic Recreation
Judicial Ditch 22 Unnamed Cr to Silver Cr	FC	Aquatic Recreation

Common Resource Areas

The Lower Minnesota Watershed is located within two common resource areas, CRA 91A and CRA 103.1. /9



Only the major CRA units are described above. For further information, go to:
http://soils.usda.gov/survey/geography/cra.html

91A – Central Minnesota Outwash: Nearly level to gently sloping well drained sandy soils on outwash plains and stream terraces. There are also numerous poorly and very poorly drained mineral and organic soils. Irrigated crop land, pasture and hayland are the major land uses. Forestland is common in parts. Corn, soybeans, edible beans and potatoes are the primary irrigated crops. Forage crops are also extensively grown. Resource concerns are wind erosion, water quality, nutrient management, improperly managed grazing.

103.1 – Iowa and Minnesota Till Prairies: Primarily loamy glacial till soils with scattered lacustrine areas, potholes, outwash and flood plains. Nearly level to gently undulating with relatively short slopes. Most of the wet soils have been artificially drained to maximize crop production. Primary land use is cropland. Corn, soybeans, sugar beets, peas and sweet corn are the major crops. Native vegetation was dominantly tall grass prairie. Resource concerns are water and wind erosion, nutrient management, and water quality.

Geology / Soils /10

Glacial deposits ranging in thickness from zero to slightly over five hundred feet cover the Lower Minnesota River watershed. The thickest drift deposits are localized in two deep buried bedrock valleys, one east and one west of the Minnesota River. The glacial deposits are predominantly till, an unsorted, unstratified mixture of clay, silt, sand, and gravel (Anderson et. al 1974). Bedrock geology of the Lower Minnesota River watershed consists of poorly consolidated marine and continental shales of Cretaceous age.

The University of Minnesota's Department of Soil, Water and Climate delineates the western half of the Lower Minnesota watershed as fairly flat with surface deposits composed mainly of wetter clays and silts. Landscapes here are primarily flat (0-2% slopes), extensively ditched and poorly drained or tile drained. A geomorphological shift occurs in the eastern half of the watershed as landscapes are composed mainly of morainal complexes. The western half of this section of the watershed is classified as being composed of Less Steep Moraine. Agricultural lands within this area are dominated by moderately steep (2-12%) well drained soils, although one fourth of the land is flat sloped (0-2%) and tile drained. Fifty percent of the cropped lands have a high potential for water erosion.

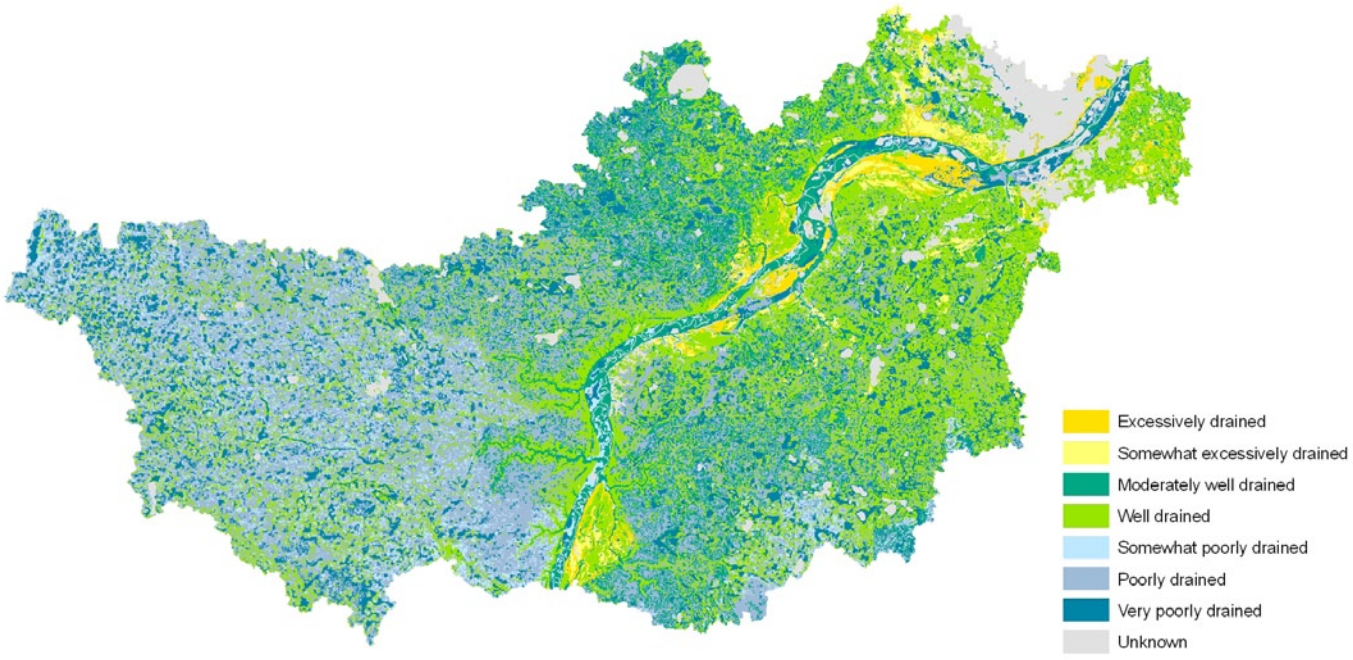
The eastern quarter of the watershed is found within Steep Wetter Moraine. This region includes the rapidly expanding suburban areas of the Twin Cities. Much of the land next to streams is very steep, with a large potential for sediment delivery to streams. Soil textures in this region range from sandy loam to loam, and landscapes are primarily well drained with a high water erosion potential.

Visit the online Web Soil Survey at http://websoilsurvey.nrcs.usda.gov for official and current USDA soil information as viewable maps and tables. Visit the Soil Data Mart at http://soildatamart.usda.gov to download SSURGO certified soil tabular and spatial data.

Drainage Classification

Drainage class (natural) refers to the frequency and duration of wet periods under conditions similar to those under which the soil formed. Alterations of the water regime by human activities, either through drainage or irrigation, are not a consideration unless they have significantly changed the morphology of the soil.

Seven classes of natural soil drainage are recognized–excessively drained, somewhat excessively drained, well drained, moderately well drained, somewhat poorly drained, poorly drained, and very poorly drained. These classes are defined in the “Soil Survey Manual.”



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Farmland Classification

Farmland classification identifies map units as prime farmland, farmland of statewide importance, farmland of local importance, or unique farmland.

Farmland classification identifies the location and extent of the most suitable land for producing food, feed, fiber, forage, and oilseed crops.

NRCS policy and procedures on prime and unique farmlands are published in the Federal Register, Vol. 43, No 21, January 31, 1978.

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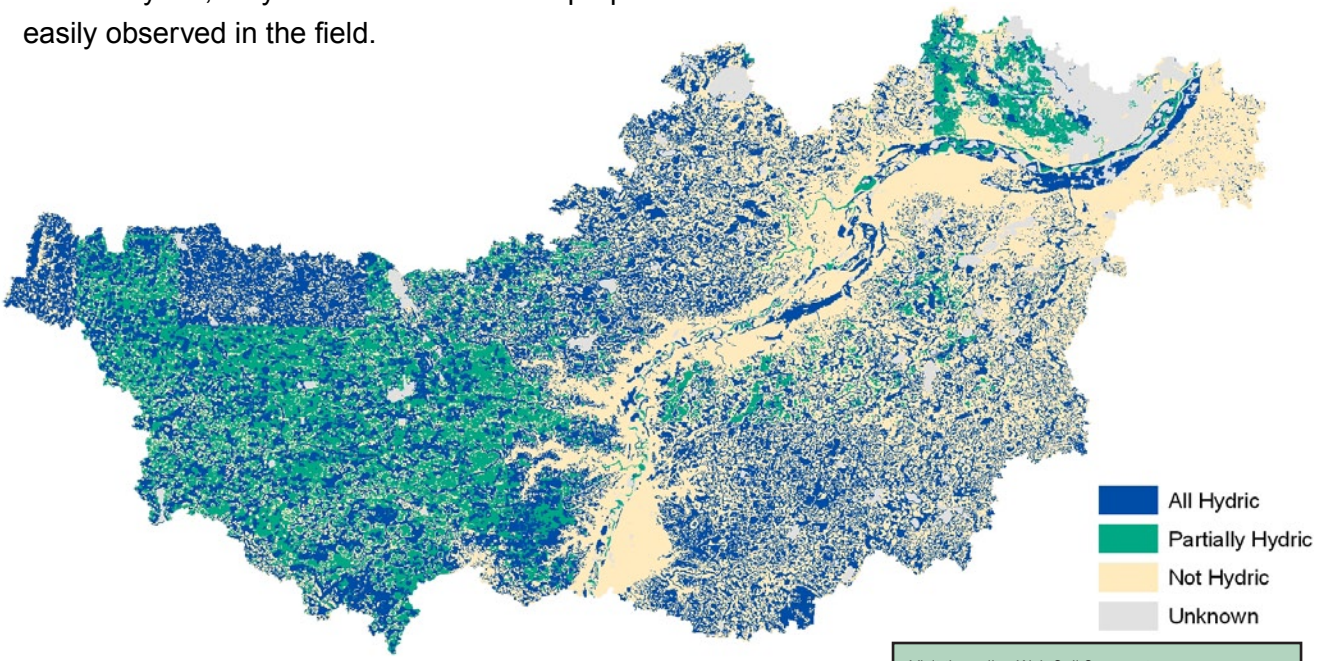
Hydric Soils

This rating provides an indication of the proportion of the map unit that meets criteria for hydric soils. Map units that are dominantly made up of hydric soils may have small areas, or inclusions of non-hydric soils in the higher positions on the landform. Map units of dominantly non–hydric soils may therefore have inclusions of hydric soils in the lower positions on the landform.

Hydric soils are defined by the National Technical Committee for Hydric Soils (NTCHS) as “soils that formed under conditions of saturation,
flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part” (Federal Register 1994). These soils, under natural conditions, are either saturated or inundated long enough during the growing season to support the growth and reproduction of hydrophytic vegetation.

If soils are wet enough for a long enough period of time to be considered hydric, they should exhibit certain properties that can be easily observed in the field.



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Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management.

The criteria used in grouping the soils does not include major and generally expensive land forming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for forestland, or for engineering purposes.

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Performance Results System Data

Watershed Name: Lower Minnesota				Watershed Number: 7020012						
PRS Performance Measures	**FY99**	**FY00**	**FY01**	**FY02**	**FY03**	**FY04**	**FY05**	**FY06**	**FY07**	**TOTAL**
Total Conservation Systems Planned (acres)	8,647	10,306	0	18,682	16,876	N/A	24,467	28,004	16,829	**123,811**
Total Conservation Systems Applied (acres)	3,234	13,985	0	13,634	13,634	N/A	24,590	29,650	31,947	**130,674**
Conservation Practices										
Total Waste Management (313) (numbers)	2	2	2	0	3	0	1	1	1	**12**
Riparian Forest Buffers (391) (acres)	3	206	13	372	111	13	5	326	139	**1,188**
Erosion Control Total Soil Saved (tons/year)	271	129,957	47,185	71,352	70,159	N/A	N/A	N/A	N/A	**318,924**
Total Nutrient Management (590) (Acres)	1,015	4,383	2,884	2,940	3,095	2,226	2,170	2,170	5,974	**26,857**
Pest Management Systems Applied (595A) (Acres)	0	1,581	1,478	927	1,963	419	1,537	507	1,184	**9,596**
Prescribed Grazing 528a (acres)	0	135	30	0	0	0	11	10	10	**196**
Tree & Shrub Establishment (612) (acres)	0	166	223	161	152	36	18	59	63	**878**
Residue Management (329A-C) (acres)	416	9,224	5,429	6,187	4,789	7,200	7,200	17,259	7,482	**65,186**
Total Wildlife Habitat (644 - 645) (acres)	379	4,724	1,024	2,762	3,107	406	2,762	7,571	9,852	**32,587**
Total Wetlands Created, Restored, or Enhanced (acres)	214	400	306	452	419	422	1,010	434	374	**4,031**
Acres enrolled in Farmbill Programs										
Conservation Reserve Program	2,991	7,639	2,988	3,405	2,685	N/A	1,382	3,147	4,263	**28,500**
Wetlands Reserve Program	1,897	4,438	1,637	91	34	N/A	201	35	43	**8,376**
Environmental Quality Incentives Program	2,566	5,370	2,971	1,332	1,258	N/A	14,368	18,555	19,127	**65,547**
Wildlife Habitat Incentive Program	1,146	1,251	6	0	200	N/A	4	34	34	**2,675**
Farmland Protection Program	0	0	0	0	0	N/A	0	0	0	**0**

Socioeconomic and Agricultural Data (Relevant)

The Lower Minnesota subbasin has an estimated population of approximately 518,330 people. Median household income throughout the district is $64,770 yearly, roughly 40% above the national average. Unemployment in the subbasin is estimated at 4% and aproximately 6% of the residents in the watershed live below the national poverty level.

There are an estimated 2,650 farms occurring in the Lower Minnesota Watershed. Of the nearly 2,700 operators in the subbasin, 58 percent are full time producers not reliant on off-farm income. Approximately forty-two percent of the operations are less than 180 acres in size, forty-eight percent are from 180 to 999 acres, and the remaining farms are greater than 1000 acres in size.

(MN) HUC# 7020012		Total Acres:	1,164,043
Population Data*	Watershed Population	518,329	
	Unemployment Rate	4%	
	Median Household Income	64,770	
	% below poverty level	6%	
	Median Value of Home	122,000	
Farms	# of Farms	2,652	
	# of Operators	2,693	**Percent**
	# of Full Time Operators	1,563	58%
	# of Part Time Operators	1,129	42%
	Total Crop/Pasturelands:	**795,600**	68.3%
Farm Size	1 to 179 Acres	461	42%
	180 to 499 Acres	393	35%
	500 to 999 Acres	149	13%
	1,000 Acres or more	105	9%
Livestock & Poultry	Cattle - Beef	4,754	1%
	Cattle - Dairy	18,826	3%
	Chicken	5,889	1%
	Swine	154,710	26%
	Turkey	104,755	18%
	Other	296,020	51%
	Animal Count Total:	584,955	
	Total Permitted AFOs:	811	
Chemicals (Acres Applied)	Insecticides	45,729	
	Herbicides	254,291	
	Wormicides	1,654	
	Fruiticides	8,922	
	Total Acres Treated	310,596	
	% State Chemical Totals	**2.2%**	

RESOURCE CONCERNS

County Soil and Water Conservation Districts in the watershed have identified the following resource concerns as top priorities for conservation and cost sharing efforts:

- Soil Quality, Excessive Sheet and Rill Erosion; Excessive Wind Erosion. Rapid urban growth and intensive agricultural activity make erosion a primary concern in each county within the watershed.

- Surface Water Quality: Water quality impacts from new development and land disturbing activities, flooding and erosion from surface flows, and nutrient and chemical contamination from agricultural and commercial practices.

- Ground Water Quality and Quantity: Impacts on groundwater from feedlots, landfills, mining operations, and other land disturbing activities. Groundwater aquifers are highly susceptible in the river valley, and changing land use is affecting water quantity and recharge rates.

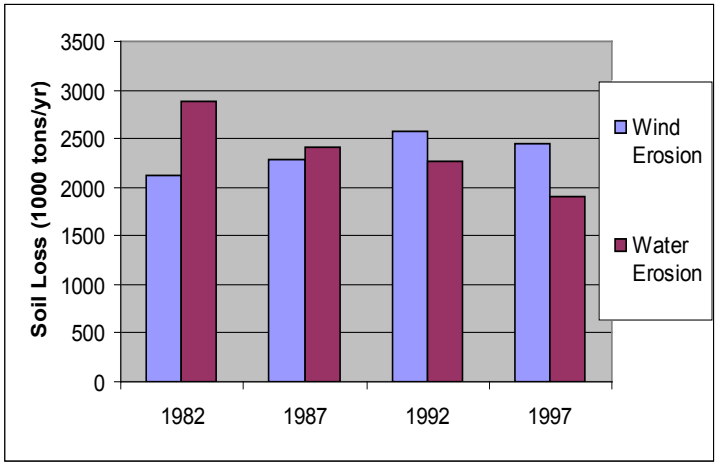
- Storm water management: Runoff from development and redevelopment activities, loss and alteration of floodplains, rate and volume control, impact of stormwater discharge on downstream conveyance systems.

- Wetland Management: Buffers in new development projects or areas undergoing redevelopment, and the preservation and protection of all agricultural wetland areas. Retaining water on the landscape through wetland creation and restoration will help address the concerns of erosion control, water quality and quantity.

NRI Soil Loss Estimates /13

NRI Estimates show sheet and rill erosion rates for cropland and pastureland decreased by approximately 982,000 tons from 1982 to 1997 (34%).

Wind erosion rates declined by 335,200 tons (15.81%) in the basin between 1982 and 1997.



Threated and Endangered Species of the Subbasin /14

Scientific Name	Common Name	Type	Scientific Name	Common Name	Type
Actinonaias ligamentina	Mucket	Zoological	Fusconaia ebena	Ebonyshell	Zoological
Agalinis auriculata	Eared False Foxglove	Botanical	Gallinula chloropus	Common Moorhen	Zoological
Alasmidonta marginata	Elktoe	Zoological	Haliaeetus leucocephalus	Bald Eagle	Zoological
Alosa chrysochloris	Skipjack Herring	Zoological	Heterodon nasicus	Western Hognose Snake	Zoological
Ammodramus henslowii	Henslow's Sparrow	Zoological	Ictiobus niger	Black Buffalo	Zoological
Apalone mutica	Smooth Softshell	Zoological	Lampsilis higginsi	Higgins Eye	Zoological
Arcidens confragosus	Rock Pocketbook	Zoological	Lampsilis teres	Yellow Sandshell	Zoological
Arnoglossum plantagineum	Tuberous Indian-plantain	Botanical	Lanius ludovicianus	Loggerhead Shrike	Zoological
Asclepias sullivantii	Sullivant's Milkweed	Botanical	Lasmigona costata	Fluted-shell	Zoological
Atrytone arogos	Arogos Skipper	Zoological	Ligumia recta	Black Sandshell	Zoological
Bacopa rotundifolia	Water-hyssop	Botanical	Megalonaias nervosa	Washboard	Zoological
Baptisia alba	White Wild Indigo	Botanical	Notropis anogenus	Pugnose Shiner	Zoological
Besseya bullii	Kitten-tails	Botanical	Oarisma powesheik	Powesheik Skipper	Zoological
Botrychium campestre	Prairie Moonwort	Botanical	Obovaria olivaria	Hickorynut	Zoological
Buteo lineatus	Red-shouldered Hawk	Zoological	Oenothera rhombipetala	Rhombic-petaled Evening Primrose	Botanical
Carex annectens	Yellow-fruited Sedge	Botanical	Orobanche fasciculata	Clustered Broomrape	Botanical
Carex sterilis	Sterile Sedge	Botanical	Panax quinquefolius	American Ginseng	Botanical
Cervus elaphus	Elk	Zoological	Perognathus flavescens	Plains Pocket Mouse	Zoological
Cicindela lepida	Little White Tiger Beetle	Zoological	Pituophis catenifer	Gopher Snake	Zoological
Cirsium hillii	Hill's Thistle	Botanical	Plethobasus cyphyus	Sheepnose	Zoological
Cladium mariscoides	Twig-rush	Botanical	Pleurobema coccineum	Round Pigtoe	Zoological
Clemmys insculpta	Wood Turtle	Zoological	Polyodon spathula	Paddlefish	Zoological
Cycleptus elongatus	Blue Sucker	Zoological	Quadrula fragosa	Winged Mapleleaf	Zoological
Cyclonaias tuberculata	Purple Wartyback	Zoological	Quadrula metanevra	Monkeyface	Zoological
Cygnus buccinator	Trumpeter Swan	Zoological	Quadrula nodulata	Wartyback	Zoological
Cypripedium candidum	Small White Lady's-slipper	Botanical	Rhynchospora capillacea	Hair-like Beak-rush	Botanical
Dendroica cerulea	Cerulean Warbler	Zoological	Scleria verticillata	Whorled Nut-rush	Botanical
Desmodium cuspidatum var. longifolium	Big Tick-trefoil	Botanical	Speyeria idalia	Regal Fritillary	Zoological
Eleocharis rostellata	Beaked Spike-rush	Botanical	Spilogale putorius	Eastern Spotted Skunk	Zoological
Ellipsaria lineolata	Butterfly	Zoological	Sterna forsteri	Forster's Tern	Zoological
Elliptio crassidens	Elephant-ear	Zoological	Talinum rugospermum	Rough-seeded Fameflower	Botanical
Elliptio dilatata	Spike	Zoological	Trillium nivale	Snow Trillium	Botanical
Empidonax virescens	Acadian Flycatcher	Zoological	Tritogonia verrucosa	Pistolgrip	Zoological
Emydoidea blandingii	Blanding's Turtle	Zoological	Valeriana edulis ssp. ciliata	Valerian	Botanical
Eryngium yuccifolium	Rattlesnake-master	Botanical	Wilsonia citrina	Hooded Warbler	Zoological
Falco peregrinus	Peregrine Falcon	Zoological			

Watershed Projects, Plans and Monitoring

- **Brown- Nicollet-Cottonwood CWP P I & II**
  Brown-Nicollet-Cottonwood Water Quality Board
- **Lake Ballantyne Lake Assessment Program**
  Minnesota Pollution Control Agency
- **German-Jefferson Lakes Water Quality Project**
  Le Sueur County Soil and Water Conservation District
- **High Island Assessment project**
  Sibley County Soil and Water Conservation District
- **Lake Volney Water Quality Improvement Project**
  Le Sueur County SWCD
- **Lake Washington-CWP PhaseI&II**
  Le Sueur and Blue Earth County Joint Powers Board
- **MN River Riparian Forest Restoration Project**
  Minnesota Rural Partners - St. Cloud State University
- **Minnesota River Turbidity TMDL Work Plan**
  Minnesota Pollution Control Agency.
- **MRAP Biological & Toxicological Assessment**
  Minnesota Pollution Control Agency
- **MRAP Land Use Assessment LevelsIII,IV**
  Minnesota Pollution Control Agency
- **Rush River Assessment Project**
  Rush River Watershed Project
- **South Central Minnesota Comprehensive County Water Planning Project**
  MN River Basin Joint Powers Board
- **Thomas & Waconia Lake Assessment Programs**
  Minnesota Pollution Control Agency
- **Lower Minnesota River Model Project**
  Metropolitan Council

Conservation Districts, Organizations & Partners

- **Area II Minnesota River Basin Projects, Inc**
  1400 E Lyon Street, Bx 267 Marshall, MN 56258
  Phone 507-537-6369 Fax 507-537-6368
- **Black Dog Water Management Commission**
  100 Civic Center Pkwy, Burnsville, MN 55337
  Phone 952-895-4505
- **Carver Co. Soil & Water Conservation District**
  219 East Frontage Road Waconia, MN 55387
  Phone: 952-442-5101 Fax: 952-442-5497
- **Dakota Co. Soil & Water Conservation District**
  4100 220th St. West, Suite 102 Farmington, MN 55024
  Phone (651) 480-7777 FAX (651) 480-7775
- **Hennepin Co. Soil & Water Conservation District**
  417 North 5th Street Minneapolis, MN
  Phone 612-379-3932
- **Le Sueur Co. Soil & Water Conservation District**
  181 W. Minnesota St. Le Center, MN 56057
  Phone 507-357-4879
- **Lower Minnesota River Watershed District**
  1600 Bavaria Road Chaska, MN 55318
  Phone 952– 227-1037 Fax 952-227-1039
- **McLeod Soil and Water Conservation District**
  2570 9th St E, P.O. Box 160 Glencoe, MN 55336
  Phone 320-864-5176 Fax 320-864-5737
- **Metropolitan Council**
  390 N. Robert St. St. Paul, MN 55101
  Phone: 651-602-1140 Fax: 651-602-1464
- **Mid-Lower Minnesota River CWP**
  520 Lafayette Rd. St. Paul, MN 55155
  Phone 612-282-5559
- **Minnesota River Basin Joint Powers Board**
  600 E. 4th St Chaska, MN 55318-2108
  Phone 952-361-6590 Fax 952-361-6594
- **Minnesota Rural Partners**
  1533 Grantham St. St. Paul, MN 55108
  Phone 651-645-9403 Fax: 651-646-3818
- **Nicollet Co. Soil & Water Conservation District**
  501 South Minnesota Avenue St. Peter, MN 56082
  Phone 507- 931-6800
- **Ramsey Co. Soil & Water Conservation District**
  2015 Rice Street Roseville, MN 55113
  Phone 612-488-1476 Fax 612-488-3478
- **Renville Soil & Water Conservation District**
  1008 W Lincoln Olivia, MN 56277
  Phone 320-523-1553 ext. 3 Fax 320-523-2389
- **Rice Co. Soil and Water Conservation District**
  1810 30th St. N. Faribault, MN 55021
  Phone 507-332-5408 Fax 507-332-9892
- **Scott Co. Soil & Water Conservation Dist**
  7151 W. 190th St., Suite 125 Jordan, MN 55352
  Phone 952-492-5425 Fax 952-492-5422
- **Sibley Co. Soil& Water Conservation District**
  111 6th Street, PO Box 161, Gaylord, MN 55334
  Phone -507-237-5435 Ext. 103

Footnotes / Bibliography

1. Ownership Layer – Source: MN Stewardship Data: Minnesota Department of Natural Resources, Section of Wildife, BRW, Inc, 2007. This is the complete GAP Stewardship database containing land ownership information for the entire state of Minnesota. Date of source material is variable and ranges from 1976 to 2007, although a date range of 1983 to 1985 predominates. Land interest is expressed only when some organization owns or administers more than 50% of a forty except where DNR could create sub-forty accuracy polygons..

2. National Land Cover Dataset (NLCD) - Originator: U.S. Geological Survey (USGS); Publication date: 19990631; Title: Minnesota Land Cover Data Set, Edition: 1; Geospatial data presentation form: Raster digital data; Publisher: U.S. Geological Survey, Sioux Falls, SD, USA.

3. Ownership layer classes grouped to calculate Public ownership vs. Private and Tribal ownership by Minnesota NRCS Rapid Watershed Assessment Staff.Land cover / Land use data was then extracted from the National Landcover Dataset Classification System and related to ownership class polygons.

4. USGS 1:100,000 Hydrography Layer .This data set represents all features coded as 'rivers' on the USGS 1:100,000-scale DLG Hydrography data set. This current version was converted to ARC/INFO by the Land Management Information Center and edge-matched across map sheet boundaries. Minnesota DNR made further modifications to the files, verified lake feature identifiers, and created a state layer from the separate 100k data. The Hydro 100k layer was compared to MPCA's 303(d) data to derive percentage of listed waters.

5. Land Cover / Land Use / Hydro 100k Buffer. Using the 100k Hydrology dataset, All streams within HUC were spatially buffered to a distance of 100 ft. National Landcover Dataset attributes were extracted for the spatial buffer to demonstrate the vegetation and landuse in vulnerable areas adjacent to waterways.

6. Land Capability Class. ESTIMATES FROM THE 1997 NRI DATABASE (REVISED DECEMBER 2000) REPLACE ALL PREVIOUS REPORTS AND ESTIMATES. Comparisons made using data published for the 1982, 1987, or 1992 NRI may produce erroneous results. This is because of changes in statistical estimation protocols and because all data collected prior to 1997 were simultaneously reviewed (edited) as 1997 NRI data were collected. All definitions are available in the glossary. In addition, this December 2000 revision of the 1997 NRI data updates information released in December 1999 and corrects a computer error discovered in March 2000. For more information: http://www.nrcs.usda.gov/technical/NRI/

7. 1997 NRI Irrigated Land Estimates. Irrigated land: Land that shows evidence of being irrigated during the year of the inventory or during two or more years out of the last four years. Water is supplied to crops by ditches, pipes, or other conduits. Water spreading is not considered irrigation; it is recorded as a conservation practice. [NRI-97] For more information: http://www.nrcs.usda.gov/technical/NRI/

8. 303(d) Stream data. Minnesota's Final Impaired Waters (per Section 303(d) Clean Water Act), 2006. Data obtained from Minnesota Pollution Control Agency (MPCA). The Minnesota Pollution Control Agency (MPCA) helps protect state water by monitoring quality, setting standards and controlling inputs through the development of TMDL plans. http://www.pca.state.mn.us/water/tmdl/index.html#maps.

Footnotes / Bibliography (continued)

9. National Coordinated Common Resource Area (CRA) Geographic Database. A Common Resource Area (CRA) map delineation is defined as a geographical area where resource concerns, problems, or treatment needs are similar. It is considered a subdivision of an existing Major Land Resource Area (MLRA) map delineation or polygon. Landscape conditions, soil, climate, human considerations, and other natural resource information are used to determine the geographic boundaries of a Common Resource Area

10. Soil Survey Geographic Database (SSURGO) Tabular and spatial data obtained from NRCS Soil Data Mart at http://soildatamart.nrcs.gov. Publication dates vary by county. Component and layer tables were linked to the spatial data via SDV 5.1 and ARCGIS 9.1 to derive the soil classifications presented in these examples. Highly Erodible Land Classification Data obtained from USDA/NRCS EFOTG Section II, County Soil Data. HEL classifications were appended to SSURGO spatial data via an ARCEdit session. Addendum and publication dates vary by county. Geological description: Anderson, H.W., Jr., Farrell, D.F., and Broussard, W.L., 1974, WATER RESOURCES OF THE LOWER MINNESOTA RIVER WATERSHED, SOUTH-CENTRAL MINNESOTA: U.S. Geologic Survey Hydrologic Investigations Atlas HA-526.

11. Lands removed from production through farm bill programs. County enrollment derived from the following: CRP Acres: www.fsa.usda.gov/crpstorpt/07Approved/r1sumyr/mn.htm (7/30/04). CREP Acres: http://www.bwsr.state.mn.us/easements/crep/easementsummary.html (7/31/03). WRP Acres: NRCS (8/16/04). Data were obtained by county and adjusted by percent of HUC in the county.

12. Socioeconomic and Agricultural Census Data were taken from the U.S. Population Census, 2000 and 2002 Agricultural Census and adjusted by percent of HUC in the county or by percent of block group area in the HUC, depending on the level of data available. Data were also taken from MPCA AFO/CAFO counts provided by county for 2005.

13. 1997 NRI Estimates for sheet and rill erosion (WEQ & USLE). The NRI estimates sheet and rill erosion together using the Universal Soil Loss Equation (USLE). The Revised Universal Soil Loss Equation (RUSLE) was not used in the 1997 NRI. RUSLE was not available for previous inventories, therefore the use of USLE was continued to preserve the trending capacity of the NRI database. Wind erosion is estimated using the Wind Erosion Equation (WEQ). For further information visit http://www.mn.nrcs.usda.gov/technical/nri/findings/erosion.htm

14. Federally listed endangered and threatened species counts obtained from NRCS Field Office Technical Guide, Section II, Threatened and Endangered List. http://www.nrcs.usda.gov/Technical/efotg/. Essential fish habitat as established by Magnuson-Stevens Fishery Conservation and Management Act, Public Law 94-265, as amended through October 11, 1996 http://www.nmfs.noaa.gov/sfa/magact/

15. Watershed Projects, Plans, Monitoring. Natural Resources Conservation Service, Watershed Projects Planned and Authorized, http://www.nrcs.usda.gov/programs/watershed/Purpose. Additional information on other individual watershed activities available from the listed party.